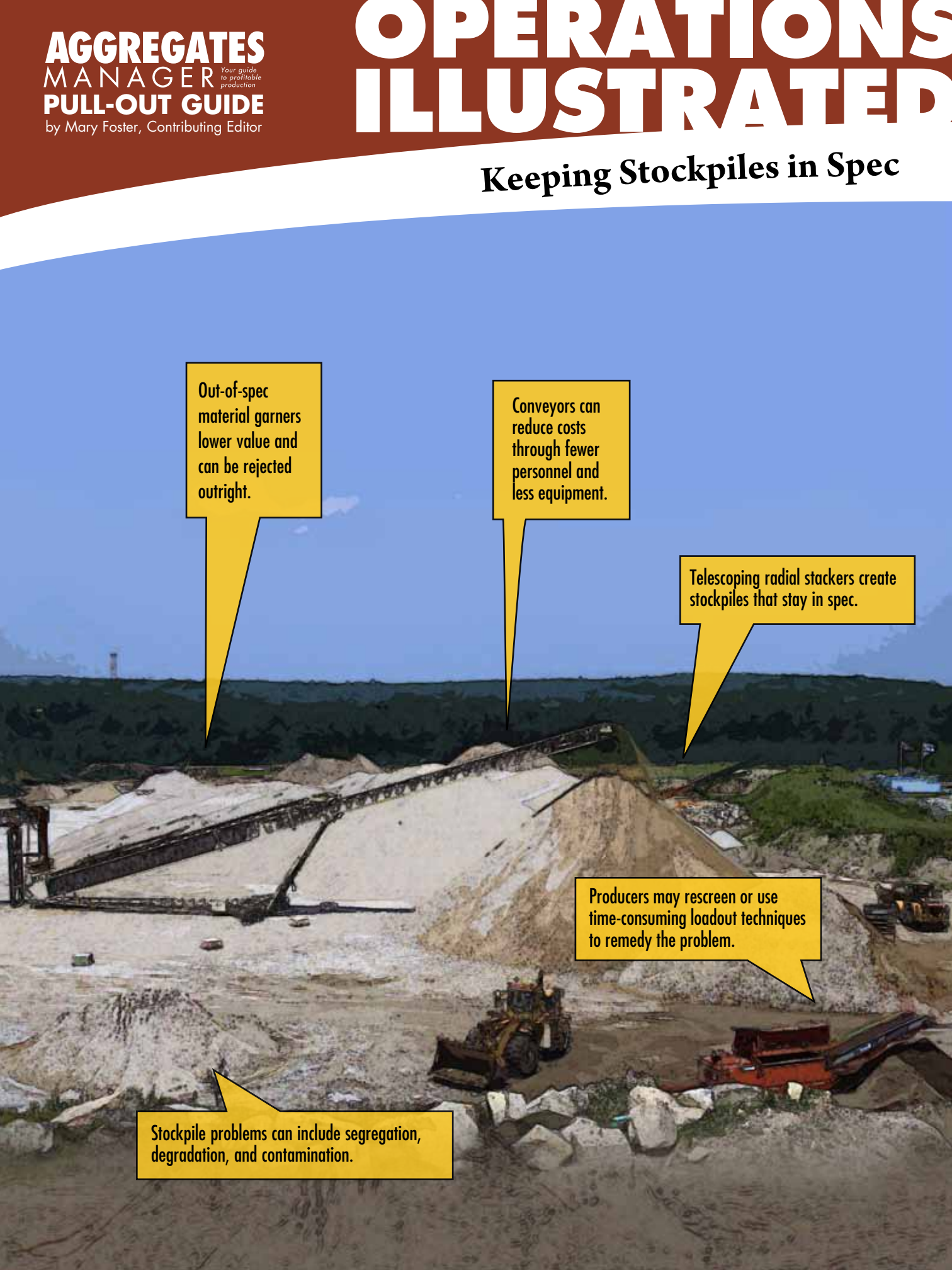


Keeping Stockpiles in Spec



Out-of-spec material garners lower value and can be rejected outright.

Conveyors can reduce costs through fewer personnel and less equipment.

Telescoping radial stackers create stockpiles that stay in spec.

Producers may rescreen or use time-consuming loadout techniques to remedy the problem.

Stockpile problems can include segregation, degradation, and contamination.

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Keeping Stockpiles in Spec

The first step in meeting specification for aggregate mixes is to properly gradate the material. But once it's in the stockpile, how do you keep it in spec? Traditional stacking techniques often cause the stockpile to segregate, with coarser particles falling down the outside of the pile while the finer material stays on top. The practice of driving loaders or dozers onto the piles as they're being built can cause degradation or contamination for an in-spec stockpile.

"Material that does not pass engineered specs for DOT concrete and asphalt mixes may result in the company paying a penalty or being docked — or the inspector might just completely reject the material," says Lafe Grimm, chief engineer, portable systems, for Superior Industries, based in Morris, Minn. "If this is the case, there usually will be another market for it, such as fill, but it will sell for a reduced price, which itself is a penalty."

According to Grimm, the single best solution for building a stockpile that stays in spec is the use of a telescoping radial conveyor. This type of conveyor not only travels from side to side, but it also has a "stinger" portion that telescopes in and out. The result is that the conveyor is able to create many small stockpiles that become horizontal windrows. As the stockpile grows vertically, the material has no chance to segregate.

Hubbard Construction, in Winter

Park, Fla., receives most of the aggregate for its hot-mix asphalt plants by ship. Mike Stacey, Hubbard's plants manager, says, "Our initial shipments segregated as the aggregates were loaded onto the ship and further segregated as they were off-loaded and stockpiled by traditional stationary conveyor." In 2009, Hubbard bought telescoping radial stackers and has since not had a problem meeting DOT specs for its asphalt plants. "We still experience a small amount of segregation when loading the ships," Stacey says, "but the new radial stackers bring us back to target gradation with very little variability."

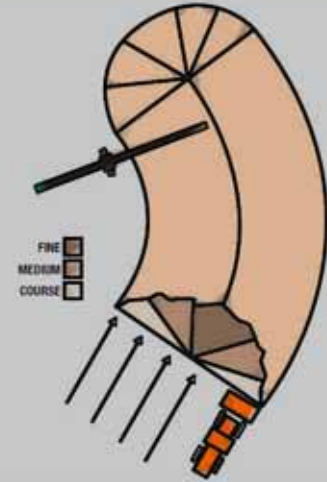
Similarly, Greg Schildberg, vice president for Greenfield, Iowa-based Schildberg Construction Co., has been using telescoping radial conveyors for the past seven years to create stockpiles of spec material. "We had used various stockpiling techniques before that," he notes, explaining that the method of "bucking" a stockpile can create windrows similar to those made with a telescoping radial stacker. "The problem wasn't so much that we were out of spec; it was the fact that certain state DOTs no longer allowed loaders or dozers to drive on top of a stockpile," he says.

Schildberg and Stacey agree that the initial benefit of using telescoping conveyors was the ability to meet DOT specs. The stackers have also reduced the cost of rehandling material, as well as reduced workforce needs.

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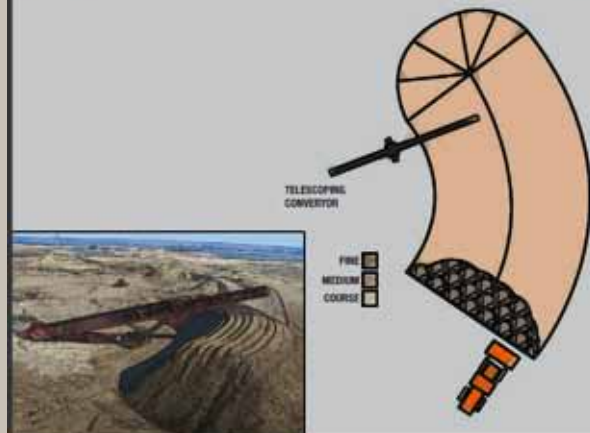
Segregation and other problems



Stockpiles that stack traditionally can segregate, with coarser material falling to the bottom/outside, and finer material remaining in the center and top. Degradation can occur if loaders or dozers drive onto the stockpile, or if material is falling from a great height — potentially splitting or crushing the graded material. Equipment driving on stockpiles can also cause contamination, as it tracks dirt or loose material onto the stockpile.

4

Convey material into windrows



Using a telescoping radial conveyor to create windrows is a simple way to create and keep stockpiles in spec. The pattern of rows and layers creates miniature stockpiles within the pile. The telescoping radial stacker moves side to side with a stinger component that moves in and out to create multiple windrows. As the end of the stacker rises, the windrows grow vertically. Segregation is minimal, and the material is reblended with the loader as the pile is reclaimed for loadout.

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2 Out-of-spec stockpile solutions



If material does not pass engineered specs, DOT inspectors may assess a penalty or completely reject the material. Producers may then opt to sell the material for other uses — at a reduced price — or rescreen and reblend the material to try and bring it back into spec. If the gradation is correct, but the stockpile is segregated, the loader operator may scoop outside to inside from the ends of the stockpile, to try and bring the material back into spec as it is reclaimed.

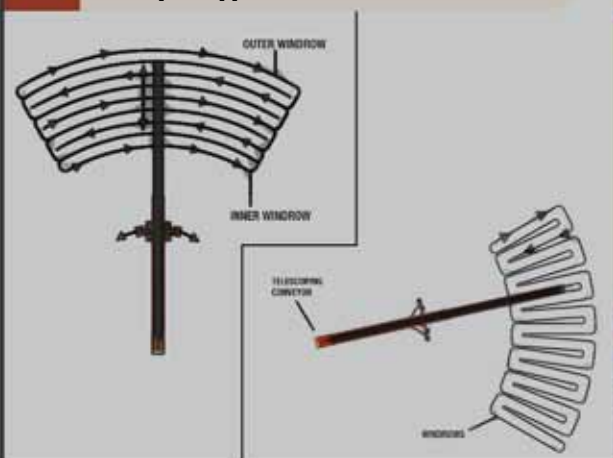
3 Stockpiling options



Producers have tried to eliminate stockpiling problems by creating smaller stockpiles, which take up more space. “Bucking” a stockpile requires the loader operator to add graded material along the face of the pile until he or she reaches the end. He then brings more graded material to the pile, lifts the bucket, and adds a second level to the material at the face. The more the graded material is handled, however, the higher the production cost, and there is a greater chance it will change spec.

Mike Stacey is plants manager for Hubbard Construction in Winter Park, Fla., a subsidiary of the Hubbard Group of Orlando, Fla. Stacey oversees the company's seven hot-mix asphalt plants and is a member of the American Public Works Association, Florida Chapter.

5 Stockpile types



A radial windrow stockpile (left) is the most common type created with telescoping radial stackers. This type of stockpile generates the least segregation and, because the stinger does not move as often, the stacker encounters less wear. These should be reclaimed from the ends. If yard space is a problem, an inline windrow stockpile (right), with deep, narrow windrows, can be built to take less space. Operators should reclaim inline stockpiles from the face.

6 Additional windrow options



In fixed, stationary applications, windrows can also be created using a system of tripper conveyors that are perpendicular to each other. One tripper car dumps material to an attached conveyor that has its own tripper car; this car moves back and forth, perpendicular to the main conveyor. The setup, which may be expensive and is typically used in mining, can create long, straight windrows, as opposed to the curved windrows created by a telescoping radial stacker.



Greg Schildberg is vice president of Schildberg Construction Co. Since joining Schildberg Construction in 1978, he has handled multiple facets of the company's operations. He is a past president and board member for the Missouri Limestone Producers Association. Schildberg is on the board of the Iowa Limestone Producers Association and is its president-elect.



Lafe Grimm is a chief engineer, with an emphasis on standard products, at Superior Industries in Morris, Minn. He graduated from Kansas State University with a degree in mechanical engineering and has been with the company for six years. Day-to-day, Grimm works closely with the company's line of telescopic radial stackers and portable truck unloaders.

OPERATIONS ILLUSTRATED

Voices of Experience

Mike Stacey

We know what happens when you stack aggregate right and when you don't stack it right," says Hubbard Construction's Plants Manager Mike Stacey. Hubbard had dealt with the need to rescreen and reblend material it received by ship because the aggregate would not meet DOT specifications for asphalt mixes.

Stacey says, in 2009, Hubbard bought two telescoping radial stackers to help bring its supplied aggregate back into spec. He explains that the material that loads onto the ships with traditional conveyors actually is in spec at the time it's loaded, but because it free-falls from 50 to 70 feet at loading, it segregates on the ships. Hubbard had been unloading segregated coarse material and fine material at different times using traditional techniques and was re-blending the material to bring it back into spec. With the radial stackers, the company now blends the material as it is offloaded, so that the aggregate is in spec for DOT mixes.

This allows material to be certified for asphalt or concrete without added cost incurred while re-handling it. An alternative is to use the material for non-government mixes at a lower price. "Either way, the impact is huge because the product takes up room, and if you can't use it, you have to double handle it and restack it," Stacey says.

An additional benefit is that they have allowed Hubbard Construction to increase its production. Stacey says he believes the stackers increase safety because of their programmable automation features, which include fail-safe and material-sensing switches. Additionally, the fact that his crew is not re-handling material also improves safety on site.

Greg Schildberg

Having used telescoping radial stackers in its quarries for the past seven years, Greg Schildberg, vice president for Schildberg Construction Co., developed a number of best practices.

Previously, the company stockpiled its material with trucks. "When you add up costs of three drivers and trucks for each spread — with extra loads, consumables, and incidentals — using telescoping conveyors has just made our operation so much more efficient," he says.

Some do's and don'ts:

- Make sure the telescoping radial conveyor does not operate with a "walking tail." Schildberg says if the tail moves forward and back as the stacker raises and lowers, it can cause spillage, which can affect the radial action of the conveyor.
- Consider starting windrows on the outside, with the stinger fully extended, and retract for each windrow. This reduces the hazards created when customers want to load immediately by allowing them to load from outside the arc.
- Don't allow personnel to park or leave equipment in the radial path of the conveyor. "The conveyor is automated and will 'walk' right over them," Schildberg says.
- Add fail-safe switches and pile material at the wheels' travel limit to guarantee the conveyor will stop and the wheels will not travel beyond normal limits if something goes wrong. Material flow switches sense when material drops to the belt and stop the radial action if there is no material moving.
- Set up the emergency shutoff to shut down the conveyor any time the guarding is opened.
- Make sure the stinger belt is secured before working on the conveyor.

Lafe Grimm

Lafe Grimm, chief engineer, portable systems, for Superior Industries, explains that a stockpile built with a telescoping radial stacker will stay in spec because it is essentially creating numerous small stockpiles within the large pile. The stacker creates short windrows, one level at a time, and the head raises to ensure that the material only drops a minimal distance to the pile.

"Each small stockpile will be somewhat segregated, but that is minimized, and the pattern is repeated throughout the stockpile, so the product mixes during the stockpiling stage and also when it is reclaimed for loadout," Grimm says, explaining that the radial windrow style of stockpiling minimizes segregation and builds a stockpile with maximum volume. He says that a radial inline stockpile is sometimes used when space constraints require a deeper, narrower pile. Conical piles are a good choice if the conveyor will regularly experience an intermittent feed rate.

"A small footprint is preferable; air is free, real estate costs money, so tall is good," he says of best practices. "It is best to minimize the drop height from the pulley to the pile. Also, minimize the number of times you handle the material, with loaders, dozers, etc. Conveyors are the ideal choice for stockpiling because they are gentler on the material than trucks and loaders and will reduce degradation."

The best methods for reclaiming stockpiled material can depend on the type of stockpile. A radial windrow stockpile is ideally reclaimed from the ends to get the best mix of material. If the site layout dictates that the material must be reclaimed from the front or back of the pile, then an inline stockpile is best, Grimm says.